and the 30-day months have been increased in the proper ratio to represent 31-day periods, while the daily averages for different hour periods are, of course, based on the actual length of the records, those for the month of February covering 283 days.

Duration of precipitation in hours at Philadelphia, 1907–1916, inclusive.

[Monthly values have been reduced to the common period of 31 days, and hourly values have been determined from original results through division by the actual number of days in each month.]

	Monthly average.	Daily average.	Greatest hourly average.		Least hourly average.		Average total, 6 a. m. to noon.	Average total, noon to 6 p. m.	Per cent of monthly total, 6 a. m. to 6 p. m.
			Duration.	Hour ending—	Duration.	Hour ending—			
Jan.	119.1	3.8	0.18	11 p. m.	0.14	6 p. m.	31.0	27.3	50
Feb.	108.0	3.5	.17	5 p. m.	.13	4 a. m.	27.2	28.6	52
Mar.	103.1	3.3	.17	9 a. m.	.11	3 p. m.	29.3	23.1	51
Apr.	101.0	3.3	.15	5 p. m.	.13	4 a. m.	25.1	25.9	51
May	76.0	2.4	.13	3 a. m.	.08	5 p. m.	19.9	15.7	47
June	59.8	1.9	.10	8 p. m.	.07	noon	15.5	13.5	49
July	41.0	1.3	.09	11 p. m.	.04	10 a. m.	8.3	10.6	46
Aug.	54.6	1.8	.11	11 p. m.	.05	3 p. m.	11.8	12.7	45
Sept.	46.5	1.5	.08	7 a. m.	.04	1 p. m.	11.7	10.9	48
Oct.	59.3	1.9	.10	7 a. m.	.06	5 p. m.	15.5	11.4	45
Nov.	70.0	2.3	.11	7 p. m.	.07	4 a. m.	16.0	17.9	48
Dec.	101.7	3.3	.16	1 p. m.	.11	2 a. m.	27.8	26.3	53

The facts shown in the foregoing summary and in the preliminary work lead to the following deductions, which will be considerably elucidated on inspection of the accompanying graphs. The writer prefers not to attempt any meteorological explanations for these phenomena.

DEDUCTIONS.

1. The duration of precipitation at Philadelphia, Pa., bears an inverse relation to the mean monthly temperature, being almost three times as great in January as in July, but does not at all seasons of the year show corresponding variations between the warmest and coldest hours of daytime and night time.

2. The forenoon precipitation (6 a. m. to noon) is of greater duration than the afternoon precipitation (noon to 6 p. m.) in January, March, May, June, September, October, and December, with marked difference in January, March, May, and October.

3. The hour in which the total duration of precipitation is greatest, is a p. m. hour in all months except March, May, September, and October.

4. Except in January, February, and April, the difference in average duration of precipitation between the hours of maximum and minimum is 45 per cent or over, July having a difference of 133 per cent.

5. There is a marked falling off in the duration of precipitation in the early p. m. hours of January, March, May, and October.

6. There is a strong tendency toward increasing precipitation in the late p. m. hours of January, May, July, August, October, and November.

In this work it was thought best to include all precipitation, even in cases where the total amount for several successive hours was only a trace, that is, less than 0.01 inch. This method was followed because of the meteorological significance of the state of weather, and because it was not apparent that traces are more likely to be recorded at one time of day than another. As for the importance of the state of weather, exposure of paper and some other goods would result in damage with the lighter rainfall as well as with heavy rainfall. Whatever rates of light rainfall might have been arbitrarily excluded from the tabulation, it is felt that the results, on the whole, would have been less satisfactory. As it is, it is necessary to make some allowance for inconsequential rainfall in determining the number of hours when rain may interfere with outdoor pursuits. Of course, the amount of allowance must depend on the nature of the work, and it can be estimated better by the man familiar with the requirements of his own business than by anyone else.

In the accompanying graphs, the object is to exhibit in detail the variations in the total duration of precipitation from hour to hour, taking the month as the unit. The relative length of time during which precipitation continues in different parts of the day and night and the characteristics of the different seasons of the year with respect to dominance of afternoon precipitation or otherwise, are the main points of interest in this discussion. These matters are more easily apprehended if we make the curves represent the average total duration of precipitation for the respective months than by making them represent the corresponding averages for a single day in each month. This is the logical method of treatment rather than by daily averages, which have been employed appropriately enough by other writers in dealing with hourly amounts and frequency. In the present discussion the introduction of daily averages instead of average monthly totals for the respective hours would give values differing by only a few hundredths of an hour, and, consequently, would destroy the significance of the whole undertaking.

RAINY DAYS AND RAINFALL PROBABILITY IN THE UNITED STATES.

By R. DEC. WARD.

[Presented at the Baltimore meeting of the Association of American Georgraphers, Dec. 28, 1918.]

(Abstract.)

In teaching climatology it is necessary to steer a middle course between presenting only general principles and giving many detailed figures. Most climatic charts are impossibly complicated for class-room presentation. Therefore, it is necessary for the instructor to generalize the charts.

A generalized map of rainy days shows, that the eastern half of the United States has annually more than 80 days with 0.01 inch or more precipitation; and that most of the western half has less than 80 rainy days. Maxima are more than 170 days on the lee shores of the Lower Lakes; and 180 days on the northwestern Pacific coast. The frequency of cyclones, the amount of annual rainfall, and the season at which precipitation occurs—all are factors in the number of rainy days.

A new map of "Mean annual rain probability" shows in per cents the average chance of having rain. The figures are obtained by dividing the number of rainy days by the number of days in the year. The 20-per cent line is near the 100th meridian. Monthly and seasonal probabilities can be worked out; and for various purposes the results can be applied in lieu of seasonal forecasts.—*C. F. B.*